

§ 146.91

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(2) Indirect methods (e.g., seismic, electrical, gravity, or electromagnetic surveys and/or down-hole carbon dioxide detection tools), unless the Director determines, based on site-specific geology, that such methods are not appropriate;

(h) The Director may require surface air monitoring and/or soil gas monitoring to detect movement of carbon dioxide that could endanger a USDW.

(1) Design of Class VI surface air and/or soil gas monitoring must be based on potential risks to USDWs within the area of review;

(2) The monitoring frequency and spatial distribution of surface air monitoring and/or soil gas monitoring must be decided using baseline data, and the monitoring plan must describe how the proposed monitoring will yield useful information on the area of review delineation and/or compliance with standards under § 144.12 of this chapter;

(3) If an owner or operator demonstrates that monitoring employed under §§ 98.440 to 98.449 of this chapter (Clean Air Act, 42 U.S.C. 7401 *et seq.*) accomplishes the goals of paragraphs (h)(1) and (2) of this section, and meets the requirements pursuant to § 146.91(c)(5), a Director that requires surface air/soil gas monitoring must approve the use of monitoring employed under §§ 98.440 to 98.449 of this chapter. Compliance with §§ 98.440 to 98.449 of this chapter pursuant to this provision is considered a condition of the Class VI permit;

(i) Any additional monitoring, as required by the Director, necessary to support, upgrade, and improve computational modeling of the area of review evaluation required under § 146.84(c) and to determine compliance with standards under § 144.12 of this chapter;

(j) The owner or operator shall periodically review the testing and monitoring plan to incorporate monitoring data collected under this subpart, operational data collected under § 146.88, and the most recent area of review reevaluation performed under § 146.84(e). In no case shall the owner or operator review the testing and monitoring plan less often than once every five years. Based on this review, the owner or operator shall submit an amended testing

and monitoring plan or demonstrate to the Director that no amendment to the testing and monitoring plan is needed. Any amendments to the testing and monitoring plan must be approved by the Director, must be incorporated into the permit, and are subject to the permit modification requirements at § 144.39 or § 144.41 of this chapter, as appropriate. Amended plans or demonstrations shall be submitted to the Director as follows:

(1) Within one year of an area of review reevaluation;

(2) Following any significant changes to the facility, such as addition of monitoring wells or newly permitted injection wells within the area of review, on a schedule determined by the Director; or

(3) When required by the Director.

(k) A quality assurance and surveillance plan for all testing and monitoring requirements.

§ 146.91 Reporting requirements.

The owner or operator must, at a minimum, provide, as specified in paragraph (e) of this section, the following reports to the Director, for each permitted Class VI well:

(a) Semi-annual reports containing:

(1) Any changes to the physical, chemical, and other relevant characteristics of the carbon dioxide stream from the proposed operating data;

(2) Monthly average, maximum, and minimum values for injection pressure, flow rate and volume, and annular pressure;

(3) A description of any event that exceeds operating parameters for annulus pressure or injection pressure specified in the permit;

(4) A description of any event which triggers a shut-off device required pursuant to § 146.88(e) and the response taken;

(5) The monthly volume and/or mass of the carbon dioxide stream injected over the reporting period and the volume injected cumulatively over the life of the project;

(6) Monthly annulus fluid volume added; and

(7) The results of monitoring prescribed under § 146.90.

(b) Report, within 30 days, the results of:

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(1) Periodic tests of mechanical integrity;

(2) Any well workover; and,

(3) Any other test of the injection well conducted by the permittee if required by the Director.

(c) Report, within 24 hours:

(1) Any evidence that the injected carbon dioxide stream or associated pressure front may cause an endangerment to a USDW;

(2) Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs;

(3) Any triggering of a shut-off system (*i.e.*, down-hole or at the surface);

(4) Any failure to maintain mechanical integrity; or.

(5) Pursuant to compliance with the requirement at §146.90(h) for surface air/soil gas monitoring or other monitoring technologies, if required by the Director, any release of carbon dioxide to the atmosphere or biosphere.

(d) Owners or operators must notify the Director in writing 30 days in advance of:

(1) Any planned well workover;

(2) Any planned stimulation activities, other than stimulation for formation testing conducted under §146.82; and

(3) Any other planned test of the injection well conducted by the permittee.

(e) Regardless of whether a State has primary enforcement responsibility, owners or operators must submit all required reports, submittals, and notifications under subpart H of this part to EPA in an electronic format approved by EPA.

(f) Records shall be retained by the owner or operator as follows:

(1) All data collected under §146.82 for Class VI permit applications shall be retained throughout the life of the geologic sequestration project and for 10 years following site closure.

(2) Data on the nature and composition of all injected fluids collected pursuant to §146.90(a) shall be retained until 10 years after site closure. The Director may require the owner or operator to deliver the records to the Director at the conclusion of the retention period.

(3) Monitoring data collected pursuant to §146.90(b) through (i) shall be retained for 10 years after it is collected.

(4) Well plugging reports, post-injection site care data, including, if appropriate, data and information used to develop the demonstration of the alternative post-injection site care timeframe, and the site closure report collected pursuant to requirements at §§146.93(f) and (h) shall be retained for 10 years following site closure.

(5) The Director has authority to require the owner or operator to retain any records required in this subpart for longer than 10 years after site closure.

§ 146.92 Injection well plugging.

(a) Prior to the well plugging, the owner or operator must flush each Class VI injection well with a buffer fluid, determine bottomhole reservoir pressure, and perform a final external mechanical integrity test.

(b) *Well plugging plan.* The owner or operator of a Class VI well must prepare, maintain, and comply with a plan that is acceptable to the Director. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit. The well plugging plan must be submitted as part of the permit application and must include the following information:

(1) Appropriate tests or measures for determining bottomhole reservoir pressure;

(2) Appropriate testing methods to ensure external mechanical integrity as specified in §146.89;

(3) The type and number of plugs to be used;

(4) The placement of each plug, including the elevation of the top and bottom of each plug;

(5) The type, grade, and quantity of material to be used in plugging. The material must be compatible with the carbon dioxide stream; and

(6) The method of placement of the plugs.

(c) *Notice of intent to plug.* The owner or operator must notify the Director in writing pursuant to §146.91(e), at least 60 days before plugging of a well. At this time, if any changes have been made to the original well plugging